

**CLAIMS**

What is claimed is:

- 5     1. An optical sub-assembly for processing an optical signal, the sub-assembly comprising:
- a working path of the optical network;
- a first sub-band of the optical signal carried only by the working path;
- a protect path of the optical network;
- 10     a second sub-band of the optical signal carried only by the protect path;
- a first module disposed along the working path for affecting the working path;
- and
- a second module disposed along the protect path for affecting the protect path.
- 15     2. The sub-assembly of claim 1, wherein the first sub-band is one of a C-band and an L-band, and the second sub-band is the other of a C-band and an L-band.
3. The sub-assembly of claim 1, wherein the first and second modules are comprised of optical amplifiers.
- 20     4. The sub-assembly of claim 1, wherein the first and second modules are comprised of band pass filters.
5. The sub-assembly of claim 1, wherein the first and second modules are comprised of
- 25     channel add devices.
6. The sub-assembly of claim 1, wherein the first and second modules are comprised of channel drop devices.
- 30     7. The sub-assembly of claim 1, wherein the first and second modules are comprised of demultiplexers.

8. The sub-assembly of claim 1, wherein the first and second modules are comprised of multiplexers.

5 9. The sub-assembly of claim 1, wherein the first and second modules are comprised of interleavers.

10. The sub-assembly of claim 1, wherein the first and second modules are comprised of attenuators.

10 11. The sub-assembly of claim 1, wherein the first and second modules are comprised of dispersion compensation modules.

12. A method of processing an optical signal in an optical network, comprising the steps of:

15 separating the optical signal into a first sub-band and a second sub-band;  
routing the first sub-band through a first module and routing the second sub-band through a second module of the same type as the first module; and  
recombining the first and second sub-bands.

20 13. The method of claim 12, wherein the separating step comprises the step of routing the optical signal through an L/C splitter.

14. The method of claim 12, further comprising the step of assigning the first sub-band to one of a working path and a protect path and assigning the second sub-band to the  
25 other of the working path and protect path.

15. The method of claim 12, wherein the routing step further comprises amplifying the first sub-band with the first module and amplifying the second sub-band with the second module.

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16. The method of claim 12, wherein the routing step further comprises filtering the first sub-band with the first module and filtering the second sub-band with the second module.

17. The method of claim 12, wherein the routing step further comprises adding at least one channel to the first sub-band with the first module and adding at least one channel to the second sub-band with the second module.

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18. The method of claim 12, wherein the routing step further comprises dropping at least one channel from the first sub-band with the first module and dropping at least one channel from the second sub-band with the second module.

10 19. The method of claim 12, wherein the routing step further comprises demultiplexing the first sub-band with the first module and demultiplexing the second sub-band with the second module.

15 20. The method of claim 12, wherein the routing step further comprises multiplexing the first sub-band with the first module and multiplexing the second sub-band with the second module.

20 21. The method of claim 12, wherein the routing step further comprises interleaving the first sub-band with the first module and interleaving the second sub-band with the second module.

25 22. The method of claim 12, wherein the routing step further comprises attenuating the first sub-band with the first module and attenuating the second sub-band with the second module.

23. The method of claim 12, wherein the routing step further comprises compensating for dispersion of the first sub-band with the first module and compensating for dispersion of the second sub-band with the second module.

30 24. An optical amplifier node for amplifying an optical signal, the amplifier node comprising:

a first amplifier for amplifying only signals from a first sub-band of the optical signal, wherein the signals are carried only by a working path; and

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a second amplifier for amplifying only signals from a second sub-band of the optical signal, wherein the signals are carried only by a protect path.

25. The optical amplifier node of claim 24, further comprising a sub-band splitter for  
5 splitting the optical signal into at least two sub-bands.

26. The optical amplifier node of claim 25, wherein the sub-band splitter is an L/C splitter.

10 27. The optical amplifier node of claim 24, further comprising a sub-band combiner for combining at least two sub-bands into the optical signal.

28. The optical amplifier node of claim 27, wherein the sub-band combiner is an L/C combiner.

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